

## CLAIMS

1. A process for the production of a modified polyester with improved rheological and mechanical properties, comprising:  
mixing and melting a polyester with a hyperbranched polymer (HBP) to form a molten mixture;  
converting the molten mixture into a solid form by cooling; and  
subjecting the mixture in solid form to a solid phase post-condensation.
2. The process according to claim 1, wherein the polyester is a polyethylene terephthalate.
3. The process according to claim 1, wherein the polyester is a recycled polyethylene terephthalate.
4. The process according to claim 1, wherein the HBP has at least six free reactive groups.
5. The process according to claim 1, the reactive end groups of HBP being selected from the group consisting of hydroxyl, carboxyl, anhydride or epoxy groups.
6. The process according to claim 1, the HBP being present in a concentration, based on the polyester portion, of 0.005 % to 5 %.
7. The process according to claim 1, wherein the mixing and melting of the polyester and the HBP take place in at least one extruder.
8. The process according to claim 7, wherein the at least one extruder is a multiple screw extruder.
9. The process according to claim 7, wherein additional steps take place in the at least one extruder.

10. The process according to claim 9, wherein the additional steps include at least one of pre-drying, degassing, introducing of further additives and homogenising.

11. The process according to claim 9, wherein the additional steps include at least one of pressure build-up, melt filtration, degassing and homogenising.

12. The process according to claim 1, wherein the molten mixture is granulated.

13. The process according to claim 12, wherein the molten mixture is granulated by strand pelletising.

14. The process according to claim 1, wherein the solid phase post-condensation takes place at a temperature between 150 °C and 250 °C.

15. The process according to claim 1, wherein the solid phase post-condensation takes place continuously.

16. The process according to claim 1, comprising:  
crystallisation of the molten mixture before the solid phase post-condensation.

17. A product produced by a process according to claim 1, comprising:  
processing the solid phase post-condensation as the product in a further process step.

18. The product according to claim 17, wherein the further process step is at least one of injection molding process, an extrusion blow molding process, a film extrusion process, a profile extrusion process, a foaming process and a process for the production of fibres, yarns or packaging tapes.

19. An additive package for the production of a modified polyester consisting of:  
an HBP; and

at least one further additive, selected from the group consisting of toughening agents, nucleating agents, catalysts, dyes and pigments, stabilisers, compatibilisers, additives increasing the molecular weight or the elasticity, and reinforcing fibres or fillers.

20. The additive package according to claim 19, wherein reactive end groups of the HBP are selected from the group consisting of hydroxyl, carboxyl, anhydride and epoxy groups.

21. The process according to claim 1, wherein the HBP has at least twelve free reactive groups.

22. The process according to claim 1, the HBP being present in a concentration, based on the polyester portion, of 0.02 % to 0.4 %.